

**Annual International Training Course (2022) on  
Postharvest, Processing and Waste Utilization:  
Cutting Edge Technologies for Food Security  
5-11 August 2024**

**1. Course Title**

Postharvest, Processing and Waste Utilization: Cutting Edge Technologies for Food Security

**2. Duration**

7 days

**3. Background and Rational**

Thailand is a predominantly agricultural country and is known as the kitchen of the world. Agricultural products in Thailand are not only produced for domestic consumption, but are also an important source of export income. In recent decades, Thailand has successfully implemented the philosophy of sufficiency economics, a new theory initiated by King Bhumibol Adulyadej that aims to reduce hunger and promote happiness for all segments of the population, especially farmers who can earn more income by spending less. However, the increase in population and decrease in arable land have challenged the global problem of adequate food supply and human welfare.

"Food" has always been considered a necessity of life. Throughout our history, we can trace the development and research for better food supply, management, and security as the world's population has increased while our access to resources has remained the same or even decreased in some areas. In recent years, the world has experienced a global food crisis that impacts people, society and the environment. The United Nations recognizes the importance of this issue and has proclaimed Sustainable Development Goal 2: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture," which highlights how important food security is to human well-being. This training highlights the urgency of an effective global response, as global food security is a complex issue that requires an urgent response from the international community.

Mae Fah Luang University is located in Chiang Rai, the northern most province of Thailand, where the weather is suitable for growing a variety of fruits and vegetables and which is also known as the land of tea and coffee. The province is located near the border with various countries, such as Lao PDR, Myanmar and China, with agricultural border trade being of great importance to Chiang Rai's economy. The geographical location also makes Chiang Rai the location of the Doi Tung Development Project, founded by the Princess' mother, HRH Srinagarindra. Furthermore, this region is home to a large number of Royal Projects, the aim of which is to enhance the income of northern Thai farmers by developing a comprehensive chain of agriculture and discovering efficient goods.

The School of Agro-Industry, Mae Fah Luang University has been aware of the importance of food security issues since its establishment. In its 25 years of existence, the school has been at the forefront of accumulating knowledge and conducting research related to food in this region. The application of new technologies to food and human safety throughout the

supply chain will drive the next wave of knowledge-based industries and is another effective tool to address food security and hunger by improving the supply of safe, nutritious, and affordable food. More importantly, agricultural processing usually generates by-products or wastes, even if they still contain some active and functional ingredients. Therefore, a comprehensive approach to the utilization of waste from agricultural products and food processing by-products is always important and necessary. What is more, plant-based food protein from local ingredients or agricultural wastes is one of the magnificent topics that this training will focus on. This trend has globally emerged and is believed to be the solution concerning environmental sustainability as well as malnutrition issues.

Postharvest, Processing and Waste Utilization: Cutting Edge Technologies for Food Security offers a 7-day program that teaches the basics of conventional and emerging technologies for postharvest, food processing, and waste utilization. An online platform (Zoom meeting) will be used to encourage more participants to join in on the activities. Through case studies and other virtual activities like workshops and site visits, the participants are believed to receive experience that will enable them to apply and implement the knowledge gained in the course back home.

#### **4. Objectives**

The course aims to:

- Provide basic knowledge in postharvest, processing and waste utilization technology of agricultural produces with the skills to develop food security, add value of agricultural products and by-products, and effectively manage agricultural trade, quality measurement and control.
- Learn how to handle agricultural produces after harvest to reduce preventable losses during storage and transportation.
- Enhance knowledge and understanding of how to select appropriate technologies to maintain food security.
- Be able to select appropriate technologies for utilization of by-products in their home country.
- Promote collaboration, communication, and professional network building among participants.

#### **5. Course Contents**

##### **5.1 Course Outline**

**Lecture:** Topics are as follows;

- Overview of postharvest losses
- Logistics and supply chain for agricultural produces
- Postharvest management of fruit, vegetable, cereal and ornamental products
- Postharvest management of tea, and coffee
- Application of packaging technology for agricultural produces
- Quality measurement of raw materials and food products including chemical, physical, microbiological and consumer preference
- Food processing and preservation techniques
- Assuring food safety and quality
- The potential of the most important agricultural produce and food processing by-products.
- Plant-based protein and plant-based food production

## **5.2 Virtual Practical Class:** Topics are as follows;

- Demonstrating postharvest technology of selected vegetables and tropical fruits
- Demonstrating application of packaging technology for agricultural produces
- Demonstrating postharvest technology of tea and coffee
- Demonstrating the conventional and novel processing of selected agricultural raw materials such as vegetables, tropical fruits, and rice
- Demonstrating plant-based food processing
- Demonstrating agricultural waste utilization

## **5.3 Virtual Study Trips/ Field Trips**

Virtual field trips are provided to support the knowledge learned from lectures. The private agricultural business farms and companies (tea, coffee, rice, pineapple and citrus) as well as the Royal project in the Northern region of Thailand are included.

## **5.4 Group Working**

Experience learned from lectures and field trips will be discussed among participants. Their proposal of knowledge application to their home countries will be developed accordingly.

## **5.5 Advance Assignments**

### **1) Country Report**

Each participant is required to submit a country report pertaining to the Postharvest and Processing Technology in their respective countries. The report should contain;

- Introduction
- General information of the country
- Historical background of the subject related to the training course
- Existing problems in the applicant's section and existing laws and regulations concerning the subject
- Future project on related subject

The report should be approximately 5 pages of A4 size paper, in the form of a country report as an attachment. The typed country report should be submitted beforehand and subjected to add their learning experience during this training course to the training organizer or sent to the e-mail address: [sutthiwal.set@mfu.ac.th](mailto:sutthiwal.set@mfu.ac.th), [nattaya.kon@mfu.ac.th](mailto:nattaya.kon@mfu.ac.th)

### **2) Reading Assignment**

Participants from each country are requested to prepare information related to postharvest losses, postharvest management of agricultural products, food processing and preservation techniques, and agricultural waste utilization, etc. These will be used for the session of group work.

### **3) Project Assignment;**

- Group assignment presentation
- Individual country report presentation

## **6. Number of Participants**

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## **7. Participants Criteria**

- ☐ Be nominated by their respective government;

- ☐ Age: less than fifty (50) years old;
- ☐ Education: equivalent to a bachelor degree of university/technical college, preferably possess B.Sc. level degree on food science, food engineering, agro-industry, agricultural science, biotechnology, agricultural processing, agricultural product development, or have at least 5 years of related work experience;
- ☐ Language: proficiency in English (speaking, reading and writing).
- ☐ Health must be good in both physical and mental, each participant should have a health certificate provided by an authorized physician. This form is also attached together with the Nomination Form. Pregnancy is regarded as a disqualifying condition for participation in the course.

## **8. Invited Country**

**Asia:** Afghanistan, Bangladesh, Bhutan, Cambodia, Indonesia, Iran, Jordan, Kyrgyzstan, Lao PDR, Malaysia, Maldives, Myanmar, Nepal, Oman, Pakistan, Palestine, Philippines, Sri Lanka, Vietnam, Tajikistan, Timor-Leste, Uzbekistan, Yemen, and Thailand

**Africa:** Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Lesotho, Libya, Malawi, Mali, Mauritania, Mauritius, Morocco, Namibia, Rwanda, South Sudan, Sudan, Swaziland, Togo, Tunisia, Zambia, Zimbabwe

**Pacific:** Cook Island, Fiji, Marshalls Island, Nauru, Palau, Papua New Guinea, Vanuatu, Solomon Island, Tonga, Tuvalu\

**Member Countries:** FEALAC, OAS and CARICOM

## **9. Venue**

Online platform via Zoom Meeting

## **10. Expected Results**

People all over the world are suffering from malnutrition and the situation may worsen in the near future. Appropriate technologies are needed to ensure healthy and adequate nutrition, covering all steps of the supply and trade chain: from growing and harvesting to processing, packaging, shipping and storing food. Upon completion of this program, participants are expected to implement such measures and be prepared to transfer the knowledge to others.

## **11. Evaluation**

Participants will receive certificates if 80% attention and the 60% post-test results are achieved. Moreover, the proposal of knowledge application to their home countries will be reviewed and graded.

## **12. Institution**

The course will be conducted by:  
 School of Agro-Industry,  
 Mae Fah Luang University  
 333 Moo 1, Thasud

Chiang Rai, Thailand, 57100  
Tel: (66 53) 916738, Fax: (66 53) 916737  
E-mail: sutthiwal.set@mfu.ac.th, nattaya.kon@mfu.ac.th

### **13. Expenditure/Funding**

Thailand International Cooperation Agency (TICA), Ministry of Foreign Affairs will provide financial support to all participants during the training.

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#### Contact Information

Human Resources Development Bureau, Thailand International Cooperation Agency (TICA), Ministry of Foreign Affairs

The Government Complex Ratthaprasasanabhakti (B) Building, South Zone, 8<sup>th</sup> Floor.

120 Moo. 3 Chaengwattana Road, Thungsonghong, Laksi District, Bangkok 10210

Tel.: +66 (0) 2203 5000 ext. 43302 Fax: +66 (0) 2143 8451

E-mail;

## Country Report Format

Country report should be submitted together with the Application Form in complying the following items.

### I. Introduction

1. Name of the Training  
Course: .....
2. Name of applicant: .....  
Home Address: .....  
.....  
.....  
Phone No. (Home &Office): .....  
Fax: .....  
Email: .....
3. Name of  
Country: .....
4. Name of  
Organization: .....
5. Main Tasks of the Organization & Organization Chart  
(Please draw an organization chart, starting from “ section” as the lowest level and circling the section to which applicant belongs)
6. Applications’ Position: Roles and Responsibilities

### II. General Information of the country (1-2 pages of A4 size paper):

Geographical status of the country, climate, population, official language, social, educational and economic conditions, gross National Products (GNP), Per- capita Income, major import and export goods, natural resources and environmental situation, etc.

### III. Historical Background of the Subject Related to the Training Course

(Within 1 page of A4 size paper)

### IV. Existing Laws and Regulations concerning the subject (if any)

### V. Existing Problems in the Applicants’ section (1-2 pages of A4 size paper)

1. Current problems and/or constraints you are facing (Please describe concrete details)
2. Obstacles in the process of solving those problems
3. Countermeasures of questions for those problems or any idea which you would like to study or solve through the course

### VI. Future Program/Project on the Related Subject

1. What is the future policy/program/or project concerning with the subject.
2. How the training course is related with those future.

**VII. Expectations for the Training Course (up to 1 page of A4 size paper)**

1. Main interesting subject areas or topics in this training course and reasons why do you pick up them.
2. How do you expect to apply the knowledge and skills received from this training course after you return to your home country
3. Other matters you are expecting for this course (if any) (Basically this training program is fixed and cannot be changed upon your request)

## Tentative Programme

“Postharvest, Processing and Waste Utilization: Cutting Edge Technologies for Food Security”

Organized by Mae Fah Luang University, Thailand

5-11 August 2024

Time	Activities	Remarks
<b>Day1: 5 Aug 2024</b> (Lecture; 5 hrs)		
12:30 – 13:00	Registration	
13:00 – 13:15	Introduction to MFU and the AITC program	
13:15 – 13:30	Opening Ceremony	
13:30 – 14:45	Individual country report presentation	(Approximately 5 min/country)
14:45 – 15:00	Pre-test online	
15:00 – 15:15	Coffee break	
15:15 – 16:15	<b>Module 1:</b> Overview of postharvest losses	
16:15 – 17:15	<b>Module 2:</b> Logistics and supply chain for agricultural produces	
17:15 – 18:15	<b>Module 3:</b> Postharvest management of fruit	
<b>Day 2: 6 Aug 2024</b> (Lecture; 5 hrs)		
13:00 – 14:00	<b>Module 4:</b> Postharvest management of vegetable	
14:00 – 15:00	<b>Practice 1:</b> postharvest technology of selected vegetables and tropical fruits	
15:00 – 16:00	<b>Module 5:</b> Postharvest management of cereal	
16:00 – 16:15	Coffee break	
16:16 – 17:15	<b>Module 6:</b> Postharvest management of ornamental	
17:15 – 18:15	<b>Module 7:</b> Application of packaging technology for agricultural produces	



Time	Activities	Remarks
<b>Day 3: 7 Aug 2024</b> (Lecture; 5 hrs)		
13:00 – 14:00	<b>Practice 2:</b> Application of packaging technology for agricultural produces	
14:00 – 15:00	<b>Module 8:</b> Postharvest and processing of tea	
15:00 – 16:00	<b>Practice 3:</b> Postharvest and processing of tea	
16:00 – 16:15	Coffee break	
16:15 – 17:15	<b>Module 9:</b> Postharvest and processing of Coffee	
17:15 – 18:15	<b>Practice 4:</b> Postharvest and processing of coffee	
<b>Day 4: 8 Aug 2024</b> (Lecture; 5 hrs)		
13:00 – 15:00	<b>Module 10:</b> Food processing and preservation techniques (conventional food processing)	
15:00 – 16:00	<b>Practice 5:</b> Food processing and preservation techniques (conventional food processing)	
16:00 – 16:15	Coffee break	
16:15 – 17:30	<b>Module 11:</b> Food processing and preservation techniques (Novel food processing)	
17:30 – 18:30	<b>Practice 6:</b> Food processing and preservation techniques (Novel food processing)	
<b>Day 5: 9 Aug 2024</b> (Lecture; 5 hrs)		
13:00 – 14:00	<b>Module 12:</b> Plant-based protein and plant-based food production	
14:00 – 15:00	<b>Practice 7:</b> Plant-based protein and plant-based food production	

Time	Activities	Remarks
15:00 – 16:00	<b>Module 13:</b> Agricultural waste utilization	
16:00 – 16:15	Coffee break	
16:15 – 17:15	<b>Practice 8:</b> Agricultural waste utilization	
<b>Day 6: 10 Aug 2024</b> (Lecture; 5 hrs)		
13:00 – 14:00	<b>Virtual field trip 1:</b> Royal project	
14:00 – 15:00	<b>Virtual field trip 2:</b> Citrus plantation	
15:00 – 16:00	<b>Virtual field trip 3:</b> Pineapple plantation	
16:00 – 16:15	Coffee break	
16:15 – 17:15	<b>Virtual field trip 4:</b> Tea processing	
17:15 – 18:15	<b>Virtual field trip 5:</b> Food factory	
<b>Day 7: 11 Aug 2024</b> (Assignment; 5.5 hrs)		
13:00 – 16:00	Project Preparation	
16:00 – 16:15	Coffee break	
16:15 – 18:15	Project presentation	(Approximately 10 min/country)
18:15 – 18:30	Post-test online	
18:30 – 18:45	Closing ceremony	